

**AMENDMENTS TO THE CLAIMS**

This listing of claims will replace all prior listings of claims in the application.

**LISTING OF CLAIMS:**

1-6. (Canceled)

7. (Withdrawn – Previously Presented) The method of claim 18, further comprising corroborating the sperm count, sperm motility, and sperm morphology of the rodents from the contaminated site and of the rodents from the animal reference site with population data.

8. (Withdrawn) The method of claim 7, wherein the population data relates to species diversity.

9. (Withdrawn) The method of claim 7, wherein the population data relates to population size.

10. (Withdrawn) The method of claim 7, wherein the population data relates to sex ratio.

11. (Withdrawn) The method of claim 17, wherein the data relates to lactation state.

12. (Withdrawn) The method of claim 17, wherein the data relates to pregnancy.

13. (Canceled)

14. (Withdrawn – Previously Presented) A method according to Claim 18, wherein the contaminated site is contaminated with uranium.

15. (Previously Presented) A method according to Claim 18, wherein the contaminated site is contaminated with explosives.

16. (Previously Presented) A method according to Claim 18, wherein the rodents from the contaminated site reflect one hundred generations of exposure to the contaminated site.

17. (Withdrawn – Currently Amended) A method according to Claim 18, further comprising corroborating the ~~[[the]]~~ comparison between the sperm count, sperm motility, and sperm morphology of the rodents from the contaminated site and of the rodents from the animal reference site with data relating to female reproductive state.

18. (Currently Amended) A method for assessing ecological risk to mammals, comprising:

collecting a representative sample of rodents from a contaminated site, wherein the rodents reflect generations of exposure to the contaminated site;

collecting a representative sample of rodents from an animal reference site;

comparing sperm count, sperm motility, and sperm morphology of the rodents from the contaminated site with the rodents from the animal reference site; ~~[[and]]~~

determining whether the comparison between the sperm count, sperm motility, and sperm morphology of the rodents from the contaminated site and of the rodents from the animal reference site exceeds sperm parameter benchmarks for sperm count, sperm motility, and sperm morphology, thereby indicating if the rodents from the contaminated site have compromised reproductive success, wherein a decrease of approximately 80% to 90% in sperm count indicates comprised reproductive success;  
and

making a determination about ~~the health of~~ whether an ecological risk to terrestrial site mammals at the contaminated site is present or not based on whether said comparison exceeds the sperm parameter benchmarks.

19. (Canceled)

20. (Previously Presented) A method according to Claim 18, wherein a decrease of about 40% to 50% in sperm motility indicates comprised reproductive success.

21. (Previously Presented) A method according to Claim 18, wherein an increase of 4% or more of abnormally-shaped sperm indicates comprised reproductive success.

22. (Currently Amended) A method for assessing ecological risk to mammals, comprising:

collecting a sample of rodents from a contaminated site, wherein the rodents reflect generations of exposure to the contaminated site;

collecting a sample of rodents from a reference site;

comparing sperm count, sperm motility, and sperm morphology of the rodents from the contaminated site with the rodents from the reference site;

determining whether the comparison between the sperm count, sperm motility, and sperm morphology of the rodents from the contaminated site and of the rodents from the reference site exceeds one or more sperm parameter thresholds-for-effect, thereby indicating if the rodents from the contaminated site have compromised reproductive success; and

making a determination about whether an ecological risk to mammals at the contaminated site is present or not based on whether said comparison exceeds the sperm parameter thresholds-for-effect.

23. (Previously Presented) A method according to Claim 22, further comprising comparing organ-to-body weight ratios of the rodents from the contaminated site with the rodents from the animal reference site to determine if there is a statistically

significant decrease for the rodents from the contaminated site thereby establishing an exposure-related change.

24. (Previously Presented) A method according to Claim 22, further comprising matching the reference site and the contaminated site according to hydrology, soil, and topography.

25. (Previously Presented) A method according to Claim 22, wherein said mammals comprise rodents.

26. (Previously Presented) A method according to Claim 22, wherein said mammals comprise mice, rats, voles, or squirrels.

27. (Previously Presented) A method according to Claim 22, wherein sperm count and sperm motility are measured with a visual optics sperm analyzer.

28. (Previously Presented) A method according to Claim 22, wherein said comparing comprises conducting pair-wise statistical comparisons of sperm count, sperm motility, and sperm morphology between rodents of the contaminated site and rodents of the reference site.

29. (Canceled)

30. (NEW) A method according to Claim 22, wherein  
if the rodents at the contaminated site do not demonstrate compromised reproductive success, it is concluded that other mammals at the contaminated site are not experiencing compromised reproductive success; and

if the rodents at the contaminated site demonstrate compromised reproductive success, it is concluded that other mammals at the contaminated site have the potential to experience compromised reproductive success.

31. (NEW) A method according to Claim 22, wherein a decrease of approximately 80% to 90% in sperm count, a decrease of about 40% to 50% in sperm motility, and an increase of 4% or more of abnormally-shaped sperm indicates comprised reproductive success.